

## CLAIMS

1. A cryo pump including:

a cryogenic refrigerator;

5 a first-stage panel and a heat shield plate that are cooled in a first stage of the cryogenic refrigerator; and

a second-stage panel that is surrounded in the heat shield plate, is cooled by a second stage of the cryogenic refrigerator, and has an absorbent,

10 the cryo pump further comprising:

a notch, provided in the heat shield plate, for allowing for entrance of gas molecules; and

an additional shield for preventing entrance of heat due to radiation from a room-temperature cryo pump chamber to the  
15 second-stage panel.

2. The cryo pump according to claim 1, wherein the notch and the additional shield are positioned on the heat shield plate surrounding the second-stage panel therein.

3. The cryo pump according to claim 1 or 2, wherein the  
20 additional shield is supported by the heat shield plate via an additional shield supporting member.

4. The cryo pump according to any of claims 1 to 3, wherein the refrigerator is a horizontal type and the additional shield has a C-shaped cross section in which a  
25 portion corresponding to the refrigerator is cut.

5. The cryo pump according to claim 4, wherein the additional shield is formed in such a manner that a portion thereof having a C-shaped cross section has a length covering the second-stage panel.

5        6. The cryo pump according to any of claims 1 to 3, wherein the refrigerator is a horizontal type or a vertical type and the additional shield is tubular.

7. The cryo pump according to claim 1 or 2, wherein the additional shield is a concave or convex portion provided on  
10 the heat shield plate, and an opening for allowing for entrance of gas molecules is provided on a side face of the concave or convex portion.

8. A sputtering apparatus comprising the cryo pump according to any of claims 1 to 7.

15        9. A semiconductor manufacturing apparatus comprising the cryo pump according to any of claims 1 to 7.